

# WaitForMe - Production Requirements Document V2

Fall 2018  
CS 189A

Team WaitForMe

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## Introduction

### **Problem**

When a potential customer calls a business, the last thing they want is to be placed on hold. Things get worse when the customer has to listen to a slow and boring automatic voice message, for instance, “You can actually find out the answer on our online website [www.company.com](http://www.company.com)”, before getting in touch with a real customer service representative. Everyone has had this experience and knows that it usually results in wasted time or hanging up before the business answers the call.

From the Business perspective, many potential customers are lost because people hang up while they are on hold and don't call back. This leads to lost business opportunity and a bad reputation for the business.

### **Project Overview**

This project aims to solve this terrible on-hold experience by providing a quick and easy way to allow potential customers a way to be put in contact with a business without ever having to wait on hold for them. Our solution provides people with the opportunity to call any business they want and select to have our service wait on hold for them so they could feel free to use their time better. When the on-hold is over, the user will be connected with the business without having to have the user wait the entire time.

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## **Innovation**

We will setup a hosted service that will manage all incoming calls, gathering user input, waiting on-hold, and connecting the users with the business they are trying to reach. This service will handle all the forwarding, disconnecting, and initiating calls appropriately. For technology, we will be using Google cloud platform (GCP) to deploy our application.

A user connects with the desired business in the following way: a user first calls our WaitForMe service number, WaitForMe asks the user to enter the number of the business they wish to call, the user then dials the number they wish to call. WaitForMe calls the business number, the user navigates through the IVR of the business. When the user is placed on hold they can enter a key to indicate they want to be called back when their call is no longer on hold. When a business agent answers the call, WaitForMe will immediately call the the original user. In this way, our server helps connect the user with the business and eliminate the bad on hold experience of the user.

## **Team goals/objectives**

The project provides customers with a solution that enables them to hang up immediately if they would not like to wait for a long time. This eliminates the problem of frustrated customers due to long waits and reduces business losses due to callers hanging up and not calling back. Our goal is to minimize the customers' anger in this situation and help the businesses get back to them as soon as possible. To maximize the efficiency of our backend server, we expect that our server can handle multiple concurrent calls from different users. For the customers who would like to wait on hold, our stretch goal is to process their voice signal, detect what they like and provide them different ads and music based on the voice processing while they are waiting.

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In addition to eliminating the unsatisfied waiting on hold experience, we will also detect bogus number that the user accidentally or intentionally types in. We define a bogus number to be a non-existing or a non-business number.

### **Background**

Most businesses still make people wait on hold if they are not able to answer the customers immediately. Some businesses place their customers on hold to eliminate silence or use the ubiquitous “your call is important to us” message. In addition, most customers are extremely unsatisfied by the long long waiting time. In addition, they hate the boring music they have to listen while waiting for the business’s reply.

From the view of the business, they hardly have a record of who was calling, so they will never get back to the customers and provide them desired services.

### **Assumptions**

From the aspect of users, most customers do not want the on hold experience that wastes their time. They would prefer to have the business to call them back when a business agent is available. If the users want to wait on hold, they would not want to listen to the same endless music provided by the business. We assume that they would like to listen to some music they like or listen to a piece of comedy show. We also expect there to be potential faulty behaviors from the users. Some users may unintentionally type in a wrong business number. Some users might want to use our server to connect to their friends.

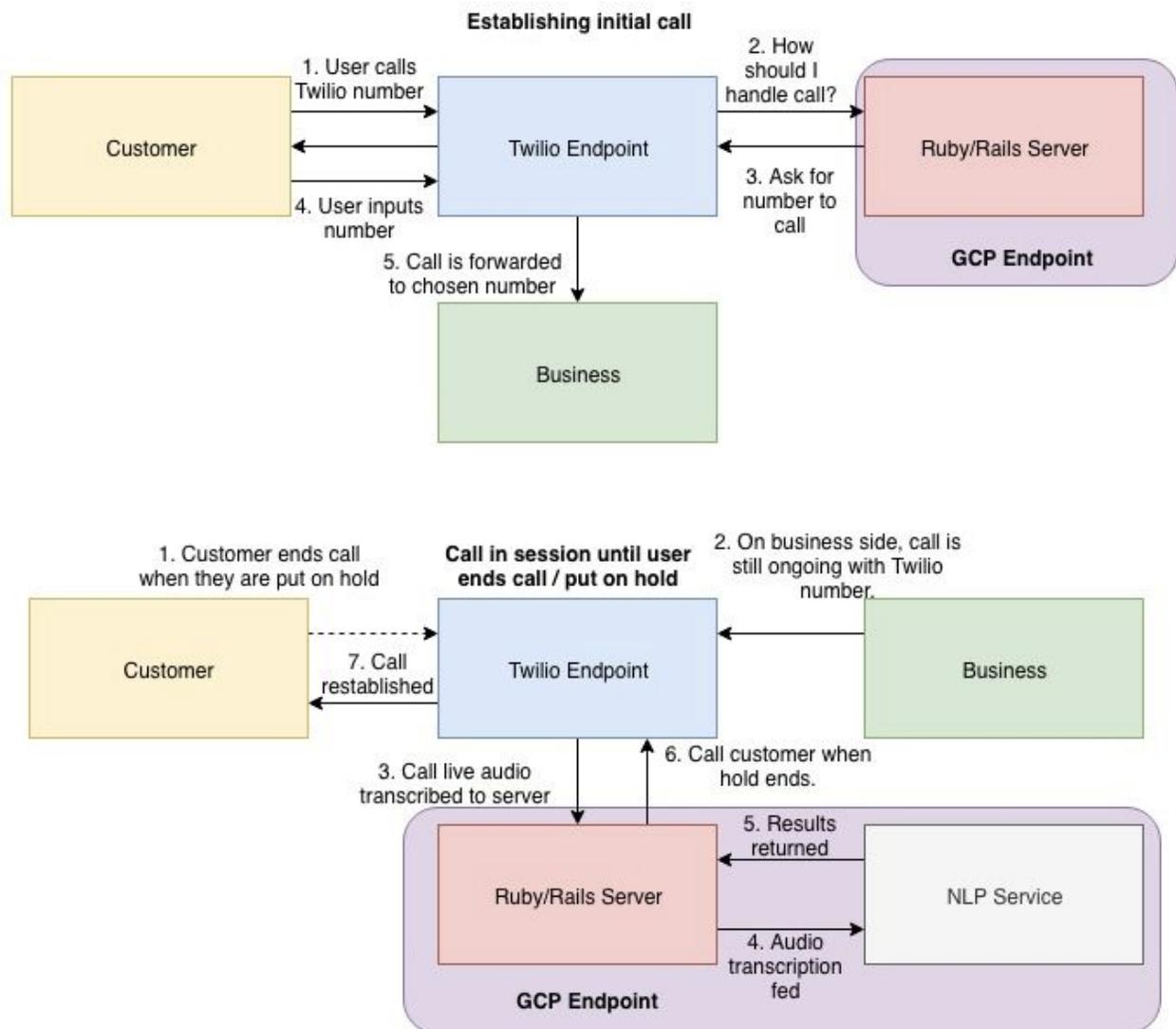
Additionally, a business point of view, they do not want to take time to check customers’ numbers and call back. The businesses would lose potential customers if they put them on hold.

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## System architecture overview



## Non-Functional Requirements

- Performance
  - The application shall call the company within N-seconds.

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- The application shall call the customer back within N-seconds after a business representative takes the call.
- Scalability
  - The application shall be able to scale horizontally to run N-copies of the application.
- Maintainability
  - The application shall be developed using Test-Driven Development and a Continuous Integration Pipeline to run tests.
- Usability
  - The application shall be usable by anyone with access to a phone line.

## Functional Requirements

### User stories

A user that wants to call a business does not have to wait on hold and deal with the phone call. Instead they are called back to directly speak with a person from that business

1. As a WaitForMe user, I want to be able to call a number that will route me to the WaitForMe application.
  - **Acceptance criteria:** I can call the WaitForMe service number. Once I am connected I can hear the IVR of the application.
  - **GitHub link:**  
[https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls_controller.rb)
  - **Trello:**  
<https://trello.com/c/XdL2CPDZ/28-user-calls-waitforme>
2. As a WaitForMe user, I want to be asked to enter the phone number of the business I want to contact.

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- **Acceptance criteria:** After calling the WaitForMe service number, I hear the IVR of the application say, “Please enter the number you wish to call”.
  - **Github link:**  
[https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls_controller.rb)
  - **Trello:**  
<https://trello.com/c/XdL2CPDZ/28-user-calls-waitforme>
3. As a WaitForMe user, I want to be able to input the phone number of the business I want to call.
- **Acceptance criteria:** After, I am asked to enter the phone number, I dial the number I wish to enter. I then hear WaitForMe repeat the number I entered, verifying that I was able to input the number.
  - **Github link:**  
[https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/master/app/controllers/calls_controller.rb)
  - **Trello:**  
<https://trello.com/c/XdL2CPDZ/28-user-calls-waitforme>
4. As a WaitForMe user, I want WaitForMe to repeat the phone number I dialed to verify I entered the correct number.
- **Acceptance criteria:** After I enter a business phone number, I hear WaitForMe repeat the number I entered.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/21>
  - **Trello:**  
<https://trello.com/c/b8mO83qr/65-number-confirmation>
5. As a WaitForMe user, I want to be able to indicate whether or not I have inputted the correct number.

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- **Acceptance criteria:** After WaitForMe, repeats the number I entered, I am able to dial 1 to verify the number is correct or dial 2 when the number is incorrect.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/22>
  - **Trello:**  
<https://trello.com/c/b8mO83qr/65-number-confirmation>
6. As a WaitForMe user, I want to be asked to enter the phone number of the business I want to contact again after I indicate the number I inputted is incorrect.
- **Acceptance criteria:** After I dial 2 to indicate that the number I entered is incorrect, I WaitForMe will ask me to enter the the number I wish call again.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/23>
  - **Trello:**  
<https://trello.com/c/b8mO83qr/65-number-confirmation>
7. As a WaitForMe user, I want to WaitForMe to call the business after I indicate the number I inputted is correct.
- **Acceptance criteria:** I will hear WaitForMe say, “Forwarding your call now”, when it calls the business.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/24>
  - **Trello:**  
<https://trello.com/c/XdL2CPDZ/28-user-calls-waitforme>
8. As a WaitForMe user, I want to be able to hang up at anytime when I no longer want to proceed with the call.
- **Acceptance criteria:** I can press the hangup button to terminate the call. If I was on hold, WaitForMe will never call me back until I request to use the service again.

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- **Github:**  
<https://github.com/nery-lara/Waitforme/tree/HangUp>
  - **Trello:**  
<https://trello.com/c/0WvUrV7I/57-hang-up-on-customer>
9. As a WaitForMe user, I want to be able to input a key to let WaitForMe know I want it to wait on hold for me.
- **Acceptance criteria:** When I am put on hold by the business, I will enter the specific key to let WaitForMe know to call me. After I enter the key, I will hear WaitForMe Tell Me the will call be back when I am no longer on hold.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/10>
  - **Trello:**  
<https://trello.com/c/euoY3uRj/66-wait-on-hold>
10. As a WaitForMe user, I want WaitForMe to tell me they will call me back when I am no longer on hold.
- **Acceptance criteria:** After I enter the key indication I will hang up, I will hear WaitForMe tell me they will call be back when I am no longer on hold.
  - **Github link:**  
[https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls_controller.rb)
  - **Trello:**  
<https://trello.com/c/hTkjewD2/61-set-outbound-call-to-business>
11. As a WaitForMe user, I want WaitForMe to store my number to know what number to call back when a business agent is on the line.
- **Acceptance criteria:** When WaitForMe says they will call me back, I will hear the application tell me what phone number they will call me back to.
  - **Github link:**

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<https://github.com/nery-lara/Waitforme/issues/12>

- **Trello:**

<https://trello.com/c/5yPOINL5/59-set-up-database>

12. As a WaitForMe user, I want WaitForMe to hang up on me after they tell me they will call me back once in a contact with a business representative.
  - **Acceptance criteria:** After I hear WaitForMe say they will call me back, I will be hung up on, I will be disconnected from the call.
  - **Github link:**  
[https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls_controller.rb)
  - **Trello:**  
<https://trello.com/c/hTkjewD2/61-set-outbound-call-to-business>
13. As a WaitForMe user, I want WaitForMe to wait on hold for me.
  - **Acceptance criteria:** When I am no longer on hold, WaitForMe will call me back with a business agent on the line. I will be able to talk to the business agent without having to be on hold.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/14>
  - **Trello:**  
<https://trello.com/c/6A9vp79f/39-waitforme-waits-on-hold>
14. As a WaitForMe user, I want WaitForMe to detect when a business agent takes my call.
  - **Acceptance criteria:** When a business agent detects my call then the business agent will hear from WaitForMe say they are being connected to the customer.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/15>
  - **Trello:**

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<https://trello.com/c/TKqfuyMO/67-connect-outbound-and-inbound-calls>

15. As a WaitForMe user, I want WaitForMe to detect if call to the business suddenly terminates due to an error (i.e the call drops).
  - **Acceptance criteria:** After the call drops and WaitForMe detects it I will receive a message from WaitForMe notifying me that the call was dropped.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/16>
  - **Trello:**  
<https://trello.com/c/t51Vdwts/68-detect-errors>
16. As a WaitForMe user, I want WaitForMe to send me a message if they lose connection with the business due to an error.
  - **Acceptance criteria:** I receive the text message in my phone saying the call was dropped.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/17>
  - **Trello:**  
<https://trello.com/c/t51Vdwts/68-detect-errors>
17. As a WaitForMe user, I want WaitForMe to call me immediately after the on-hold portion of the call is over.
  - **Acceptance criteria:** I receive a callback from WaitForMe when a business agent is on the line.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/18>
  - **Trello:**  
<https://trello.com/c/TKqfuyMO/67-connect-outbound-and-inbound-calls>
18. As a WaitForMe user, I want WaitForMe to tell the business agent they are connecting the call to me.

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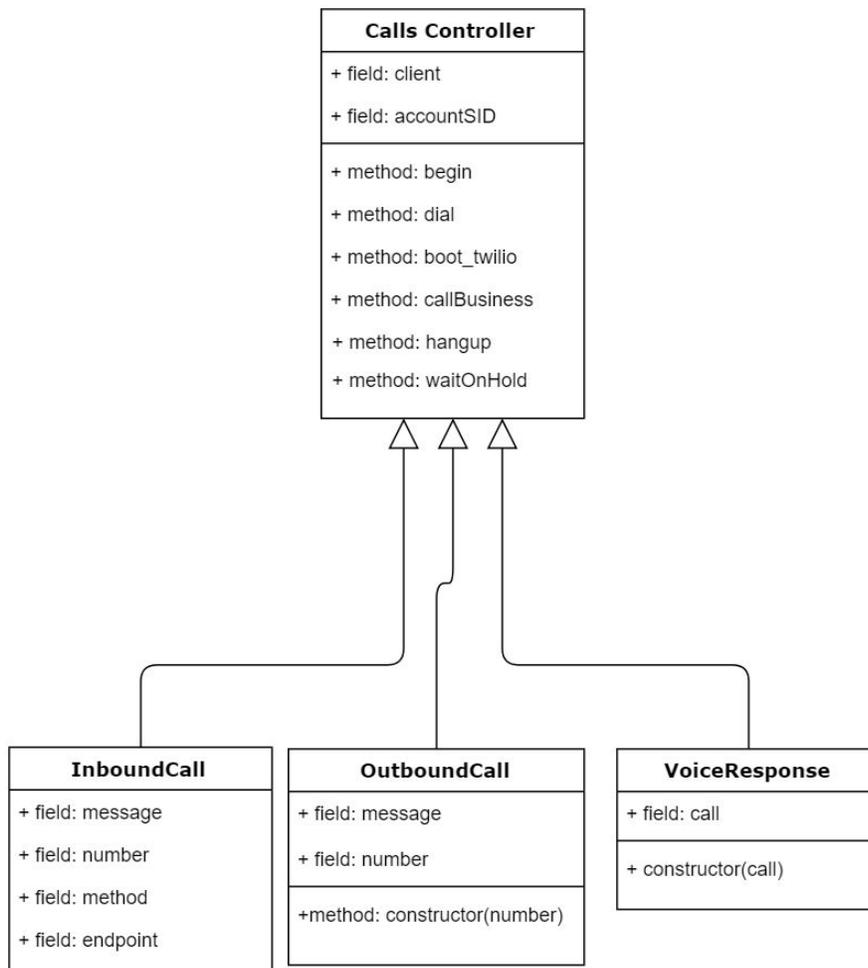
- **Acceptance criteria:** The business agent hears WaitForMe says they are being connected to the customer.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/19>
  - **Trello:**  
<https://trello.com/c/TKqfuyMO/67-connect-outbound-and-inbound-calls>
19. As a WaitForMe user, I want to be told that a business representative is on the line.
- **Acceptance criteria:** When I answer the return call from WaitForMe I hear WaitForMe say that they are connecting me to the business representative.
  - **Github link:**  
<https://github.com/nery-lara/Waitforme/issues/20>
  - **Trello:**  
<https://trello.com/c/TKqfuyMO/67-connect-outbound-and-inbound-calls>
20. As a WaitForMe user, I want WaitForMe to connect my phone call with the business.
- **Acceptance criteria:** After I answer the call and WaitForMe says a business agent is on the line, I am connected to and able to speak to the agent.
  - **Github link:**  
[https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls\\_controller.rb](https://github.com/nery-lara/Waitforme/blob/outbound/app/controllers/calls_controller.rb)
  - **Trello:**  
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## User Interactions and Design



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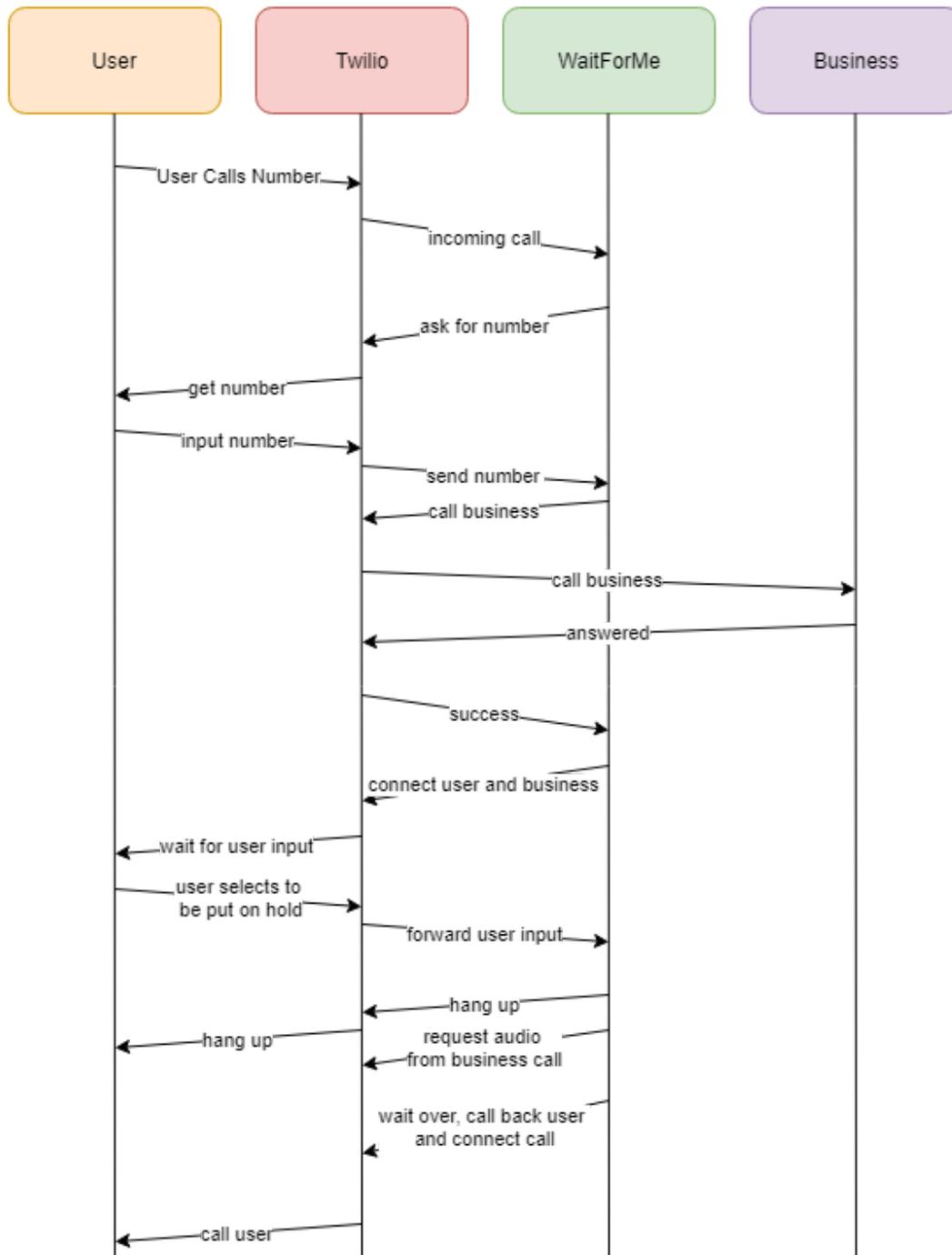


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Successful User Interaction with waiting



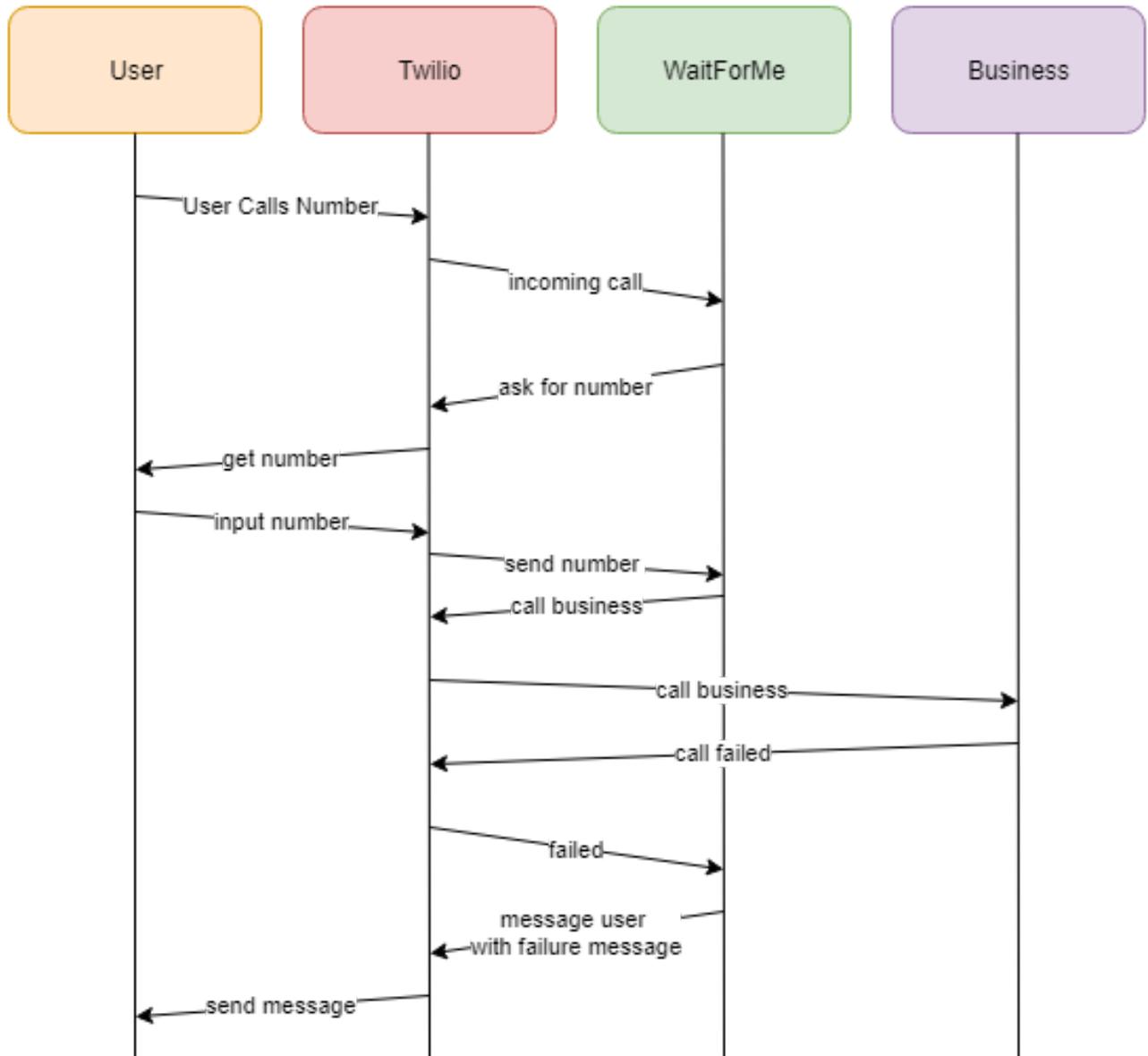
User and business now connected

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### Unsuccessful user interaction with message response



User is notified that the business did not answer

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## Appendices

- Technologies employed
  - Travis CI
  - Google Cloud Platform (App Engine)
  - Twilio
  - Ruby on Rails
  - MySQL